CLAIMS

What is Claimed:

- 1. A method for inducing an immune response in an animal, comprising:
- (a) providing a composition comprising a polynucleotide encoding at least an immunogenic portion of a WT1 polypeptide, wherein the polynucleotide has at least 90% identity to SEQ ID NO:452, 389, 453, and 381, and
 - (b) administering said composition to the animal; thereby inducing an immune response in the animal.
- 2. The method of claim 1, wherein said composition further comprises a component selected from the group consisting of a physiologically acceptable carrier and an adjuvant.
- 3. The method according to claim 1, wherein the WT1 polynucleotide is delivered by a viral based delivery system.
- 4. The method according to claim 3, wherein the viral based delivery system is an adenovirus.
- 5. The method according to claim 3, wherein the viral based delivery system is an alphavirus.
- 6. The method according to claim 1, wherein the WT1 polynucleotide is delivered as a naked DNA.

- 7. The method of claim 1, wherein the immune response induced is a CD8+ cytotoxic T lymphocyte response.
- 8. The method of claim 1, wherein the immune response induced is both a CD4+ T helper and CD8+ cytotoxic T cell immune response.
- 9. A method for treating a malignancy associated with WT1 expression in a patient, comprising administering to the patient a composition comprising a first component selected from the group consisting of physiologically acceptable carriers and immunostimulants, and a second component comprising at least an immungenic portion of a WT1 polypeptide.
- 10. An isolated polypeptide comprising at least an immunogenic portion of the WT1 protein, wherein said polypeptide comprises the amino acid sequence set forth in SEQ ID NO:241.
- 11. The isolated polypeptide according to claim 10 wherein the polypeptide has been modified such that the ability of the polypeptide to bind to HLA-A2 is increased relative to that of the polypeptide set forth in SEQ ID NO:241.
- 12. The isolated polypeptide according to claim 11 wherein said polypeptide has increased immunogenicity relative to the polypeptide set forth in SEQ ID NO:241.
- 13. The isolated polypeptide according to claim 11 wherein said polypeptide comprises an amino acid sequence selected from the group consisting of any one of SEQ ID NOs:414-450.

- 14. The isolated polypeptide according to claim 10 wherein the polypeptide has been modified such that the ability of the polypeptide to bind to HLA-A2 is increased relative to that of the polypeptide set forth in SEQ ID NO:241.
- 15. The isolated polypeptide according to claim 14 wherein said modification comprises a substitution at position 1 (P1) of SEQ ID NO:241
- 16. The isolated polypeptide according to claim 14 wherein said modification comprises a substitution at position 2 (P2) of SEQ ID NO:241.
- 17. The isolated polypeptide according to claim 14 wherein said modification comprises a substitution at position 4 (P4) of SEQ ID NO:241.
- 18. The isolated polypeptide according to claim 14 wherein said modification comprises a substitution at position 6 (P6) of SEQ ID NO:241.
- 19. The isolated polypeptide according to claim 14 wherein said modification comprises a substitution at position 8 (P8) of SEQ ID NO:241.
- 20. The isolated polypeptide according to claim 14 wherein said modification comprises a substitution at position 9 (P9) of SEQ ID NO:241.
- 21. The isolated polypeptide according to claim 14 wherein said modification comprises a substitution at position 1 (P1) and position 4 (P4) of SEQ ID NO:241.
- 22. The isolated polypeptide according to claim 14 wherein said modification comprises a substitution at position 1 (P1) and position 9 (P9) of SEQ ID NO:241.

- 23. The isolated polypeptide according to claim 14 wherein said modification comprises a substitution at position 1 (P1), position 4 (P4), and position 9 (P9) of SEQ ID NO:241.
- 24. The isolated polypeptide according to claim 14 wherein said modification comprises a substitution at position 6 (P6) and position 9 (P9) of SEQ ID NO:241.
- 25. An isolated polypeptide comprising at least an immunogenic portion of a WT1 polypeptide, wherein said immunogenic portion comprises an amino acid sequence selected from the group consisting of:
 - (i) a sequence set forth in SEQ ID NO:451; and
 - (ii) a polypeptide selected from the group consisting of:
 - (a) a sequence set forth in any one of SEQ ID NOs:414-450;
 - (b) a sequence having at least 70% identity to a sequence set forth in any one of SEQ ID NOs:414-450; and
 - (c) a sequence having at least 90% identity to a sequence set forth in any one of SEQ ID NOs:414-450; wherein the ability of the polypeptide to bind to HLA-A2 is increased relative to that of the polypeptide set forth in SEQ ID
- 26. A method for inducing an immune response in a mammal, comprising:

NO:241.

- (a) providing a composition comprising a polynucleotide encoding the isolated polypeptide of claim 25; and
 - (b) administering said polynucleotide to the mammal; thereby inducing an immune response in the mammal.

- 27. An expression vector comprising a polynucleotide of any one of the sequences set forth in SEQ ID NOs:452 and 453 or a polynucleotide encoding the isolated polypeptide of claim 25 operably linked to an expression control sequence.
- 28. A host ceil transformed or transfected with an expression vector according to claim 27.
- 29. A method for stimulating and/or expanding T cells specific for a tumor protein, comprising contacting T cells with at least one component selected from the group consisting of:
 - (a) a polypeptide according to claim 25;
- (b) antigen-presenting cells pulsed with or that express a polypeptide according to claim 26,

under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells.

- 30. An isolated T cell population, comprising T cells prepared according to the method of claim 29.
- 31. A composition comprising a first component selected from the group consisting of physiologically acceptable carriers and immunostimulants, and a second component selected from the group consisting of:
 - (a) polypeptides according to claim 25; and
 - (b) T cells according to claim 31.
- 32. A method for stimulating an immune response in a patient, comprising administering to the patient a composition of claim 31.

- 33. A method for the treatment of a cancer in a patient, comprising administering to the patient a composition of claim 32.
- 34. An isolated polypeptide comprising an amino acid sequence of any one of SEQ ID NOs:454-455.